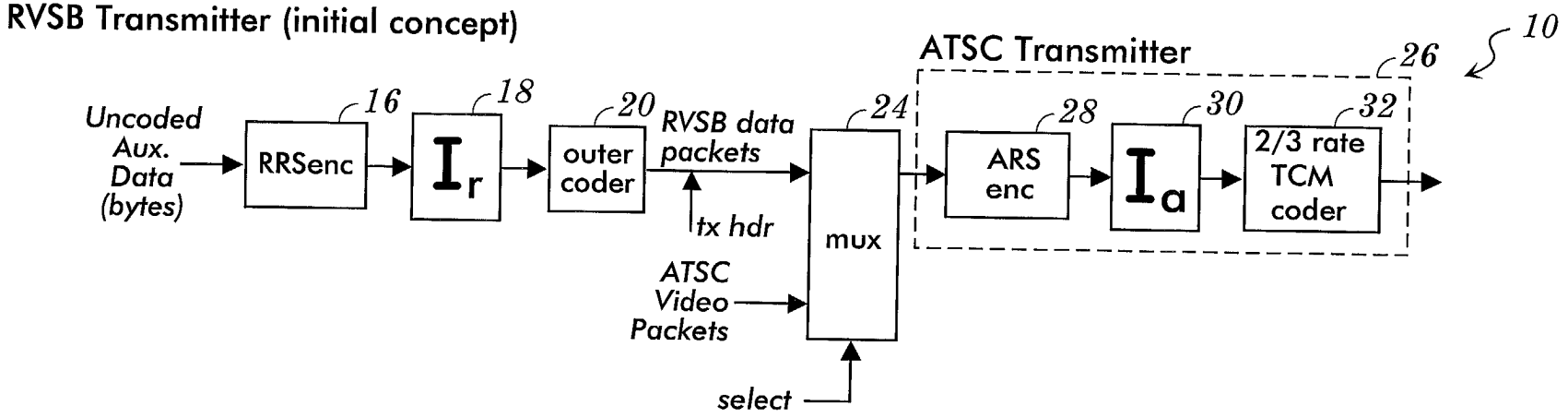

Figure 1

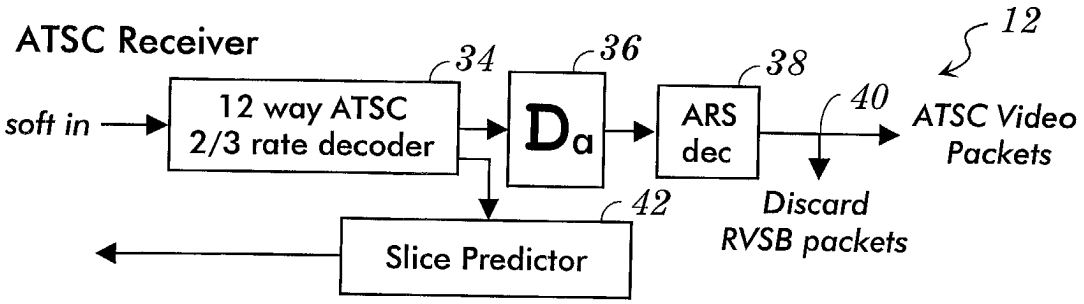

Figure 2

mapper function			
Z2	Z1	Z0	level
0	0	0	-7
0	0	1	-5
0	1	0	-3
0	1	1	-1
1	0	0	+1
1	0	1	+3
1	1	0	+5
1	1	1	+7

Figure 5

TOCTEO" 292h0860

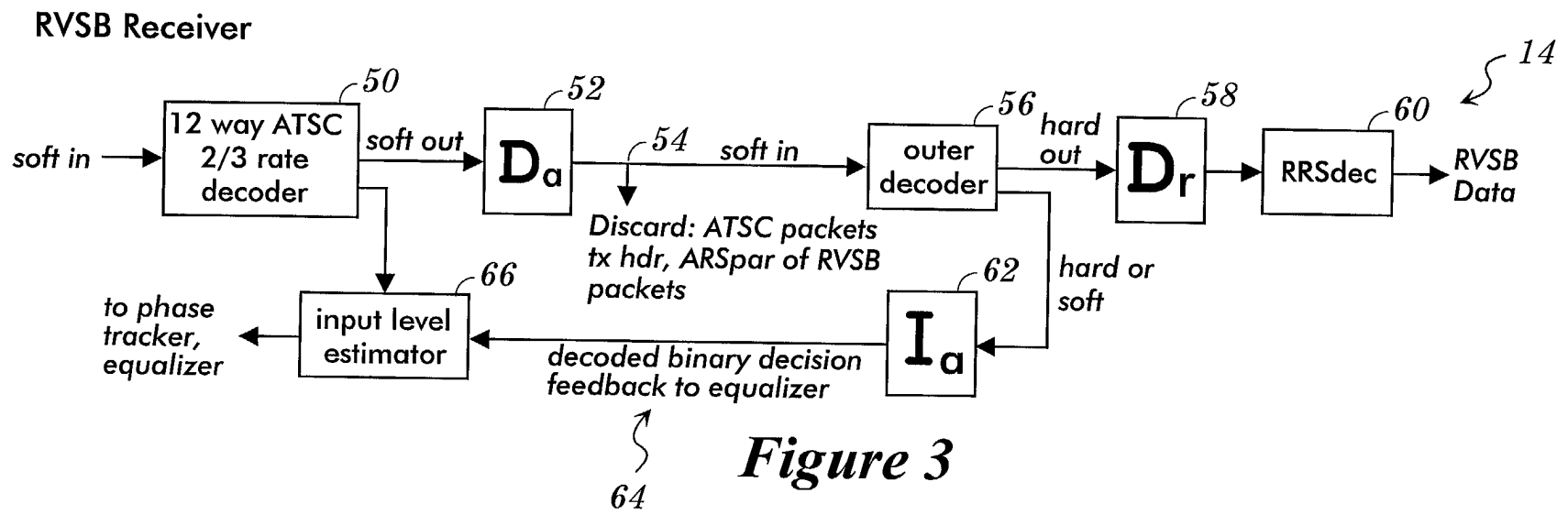

Figure 3

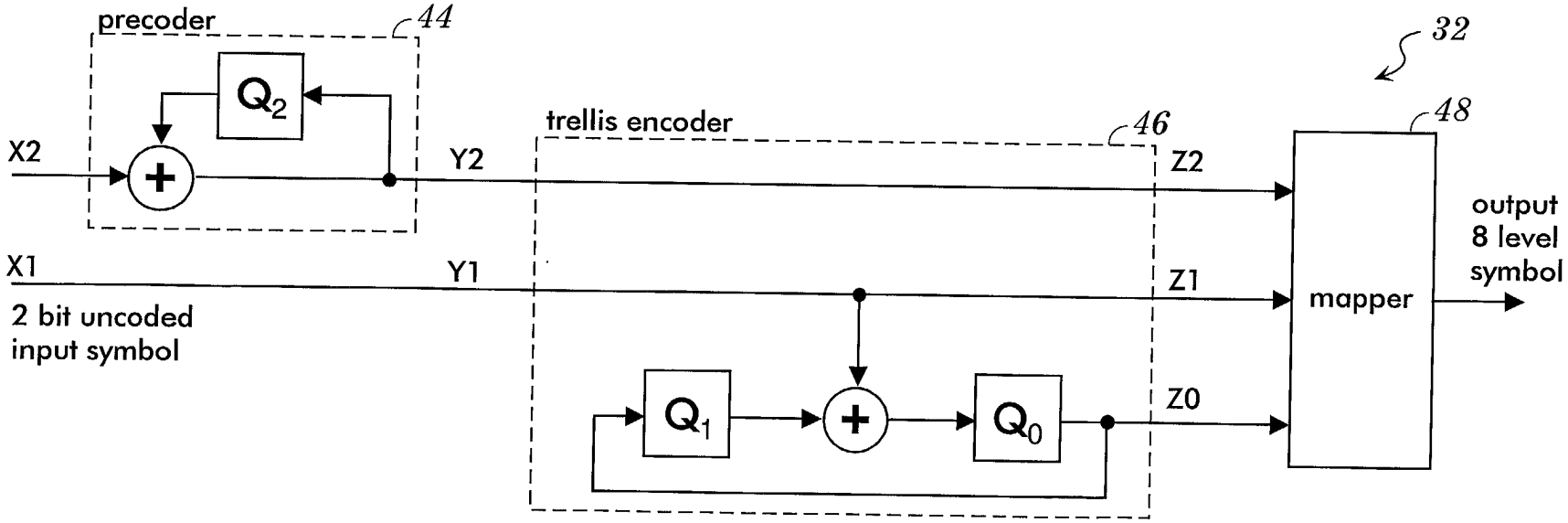

Figure 4

branch label :
X_2X_1 / mapped output level

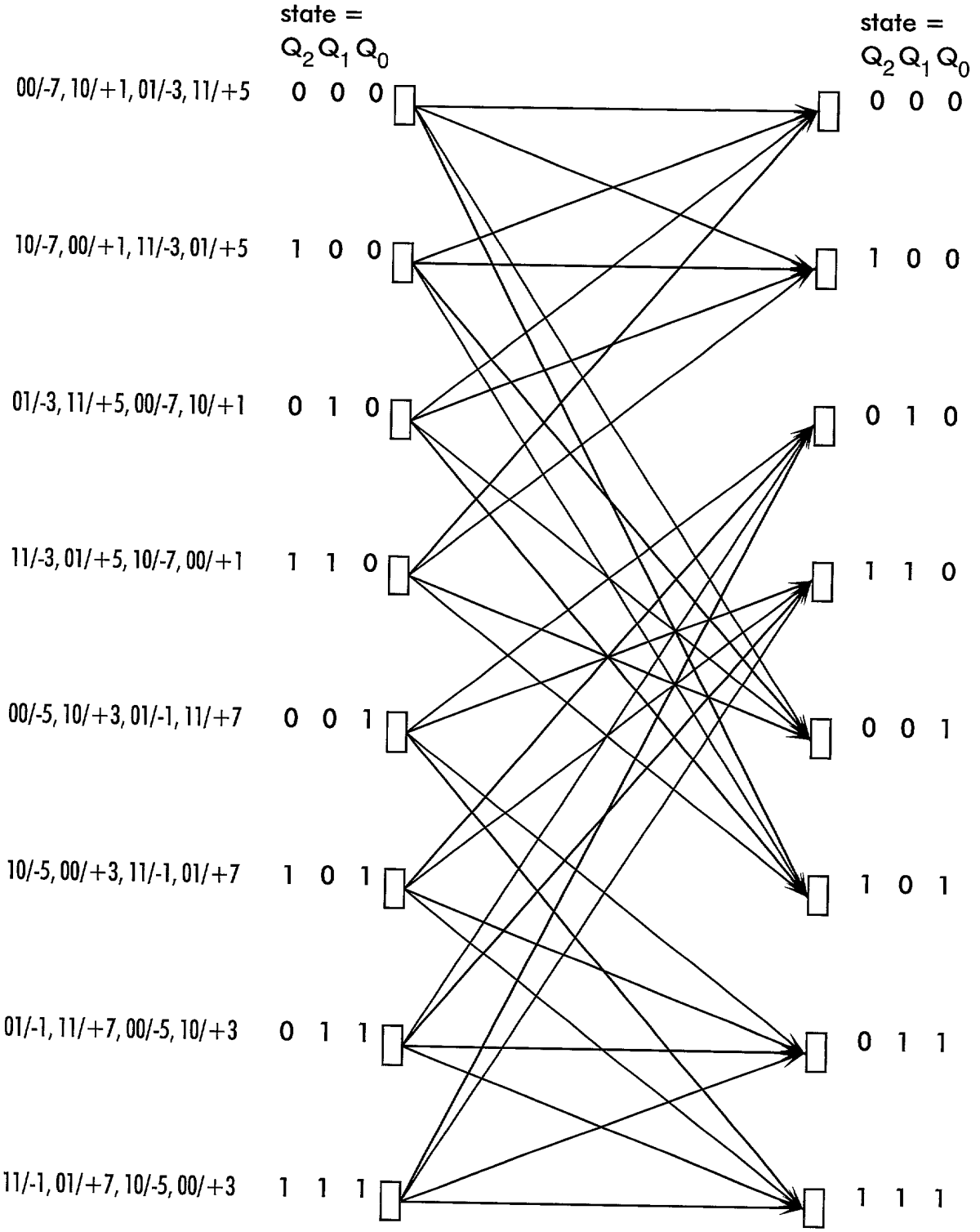

Figure 6

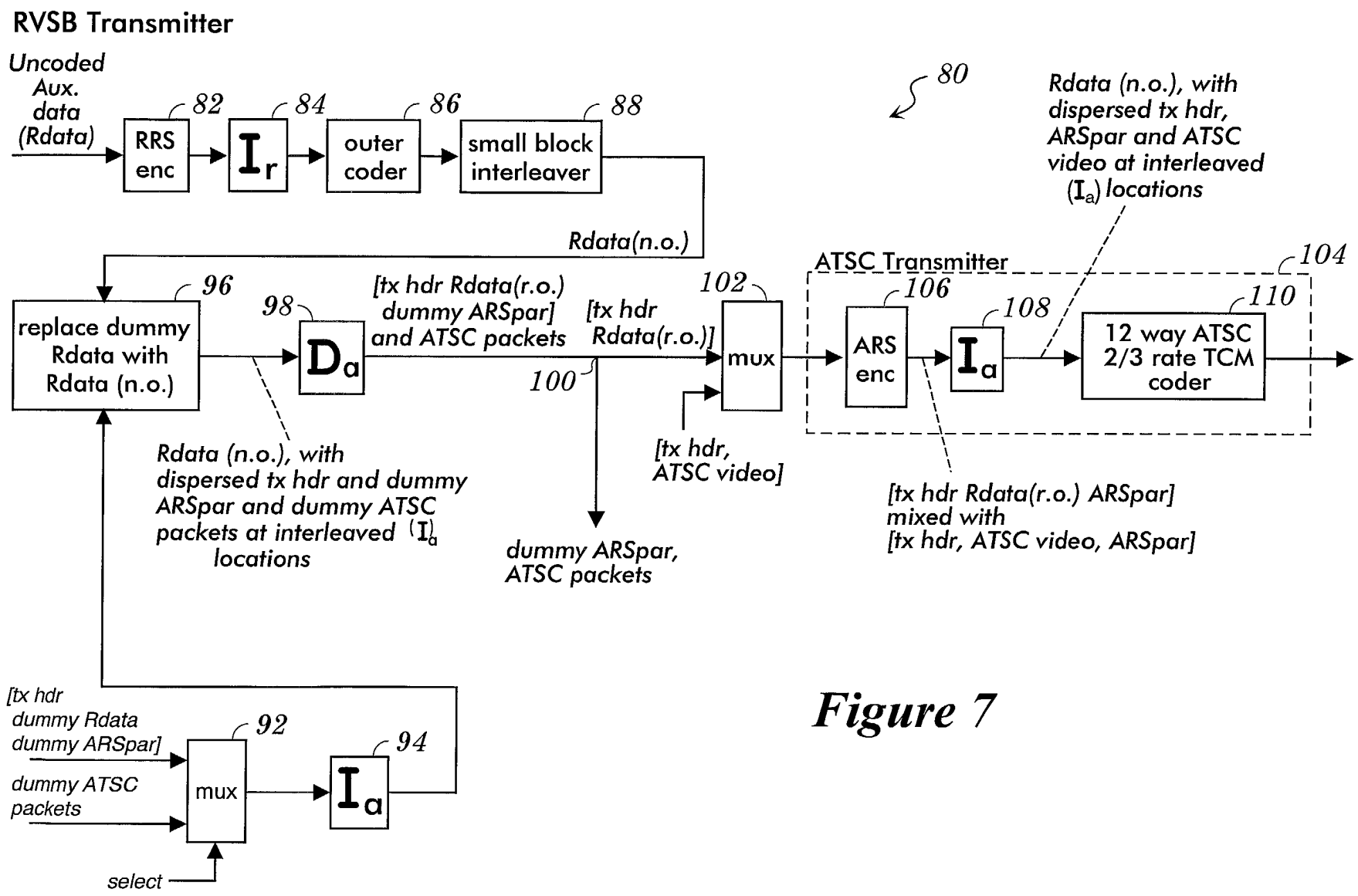
RVSB Transmitter
Uncoded Aux. data (Rdata)
82
RRS enc
84
I_r
86
outer coder
88
small block interleaver
80
Rdata (n.o.), with dispersed tx hdr, ARSpar and ATSC video at interleaved (I_a) locations
Rdata(n.o.)
ATSC Transmitter
104
96
replace dummy Rdata with Rdata (n.o.)
98
D_a
[tx hdr Rdata(r.o.) dummy ARSpar] and ATSC packets
[tx hdr Rdata(r.o.)]
102
mux
106
ARS enc
108
I_a
110
12 way ATSC 2/3 rate TCM coder
100
[tx hdr, ATSC video]
Rdata (n.o.), with dispersed tx hdr and dummy ARSpar and dummy ATSC packets at interleaved (I_a) locations
dummy ARSpar, ATSC packets
[tx hdr Rdata(r.o.) ARSpar] mixed with [tx hdr, ATSC video, ARSpar]
[tx hdr dummy Rdata dummy ARSpar]
dummy ATSC packets
92
mux
94
I_a
select

Figure 7

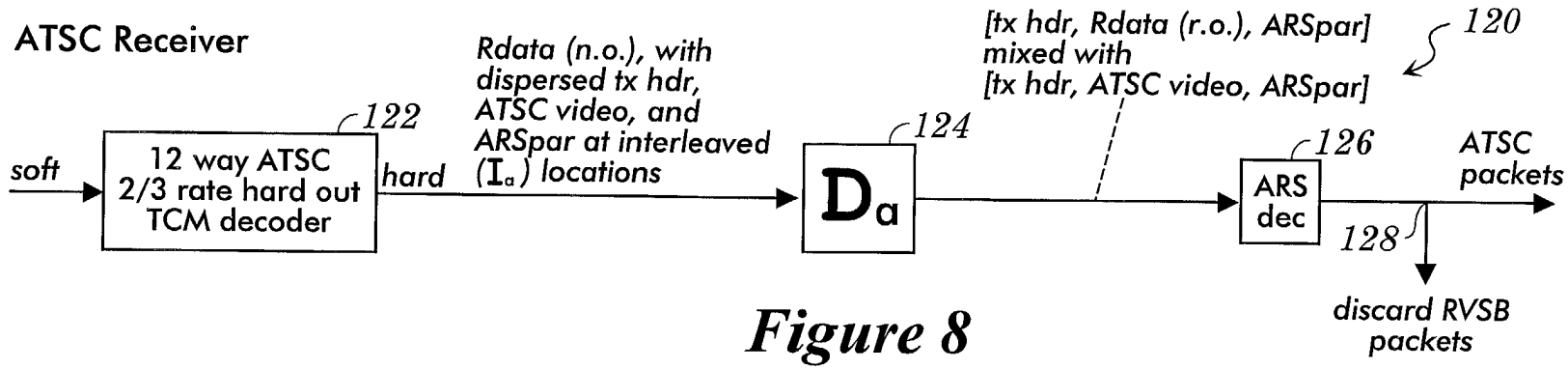

Figure 8

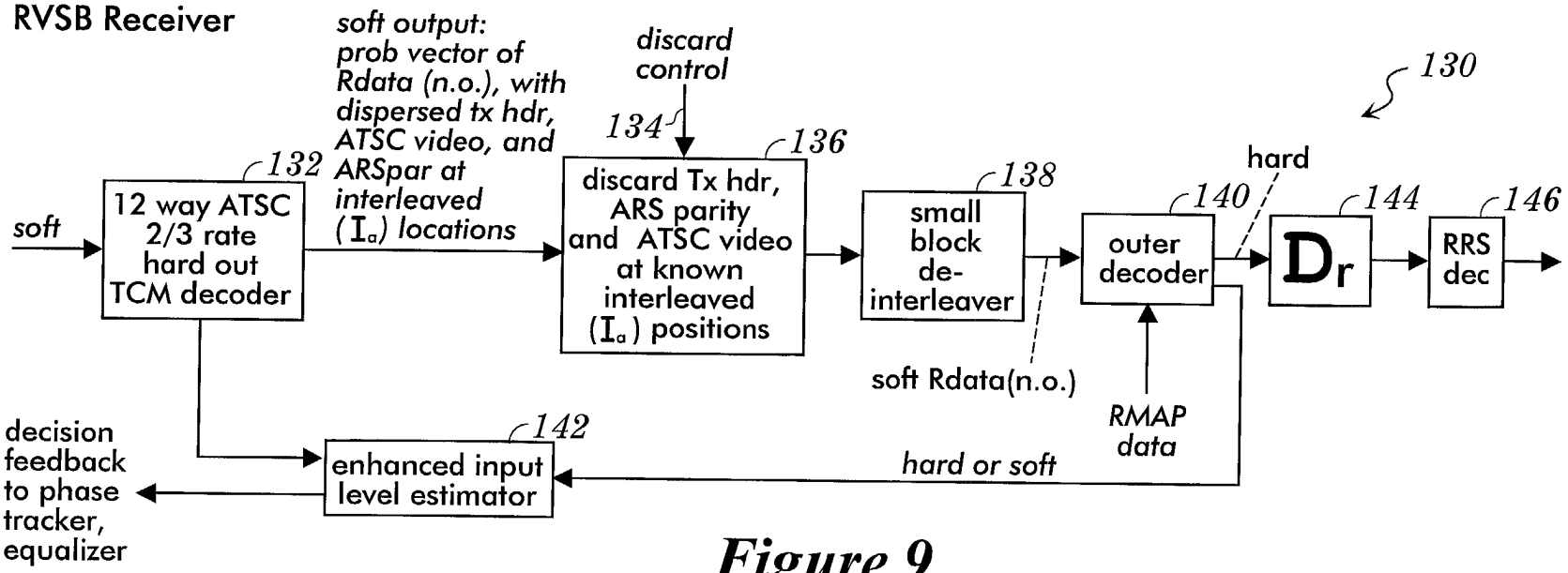

Figure 9

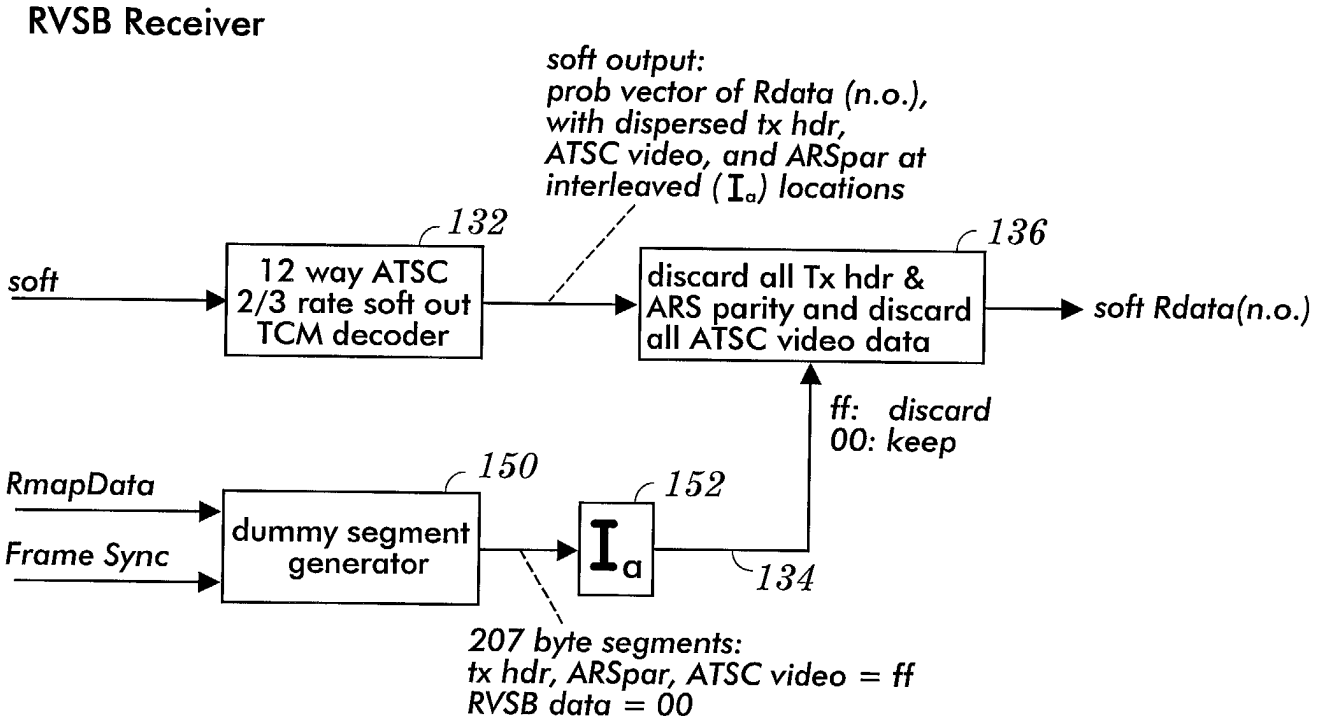
RVSB Receiver
soft output:
prob vector of Rdata (n.o.),
with dispersed tx hdr,
ATSC video, and ARSpar at
interleaved (I_a) locations
132
136
soft
12 way ATSC
2/3 rate soft out
TCM decoder
discard all Tx hdr &
ARS parity and discard
all ATSC video data
soft Rdata(n.o.)
ff: discard
00: keep
150
152
RmapData
Frame Sync
dummy segment
generator
I_a
134
207 byte segments:
tx hdr, ARSpar, ATSC video = ff
RVSB data = 00

Figure 10

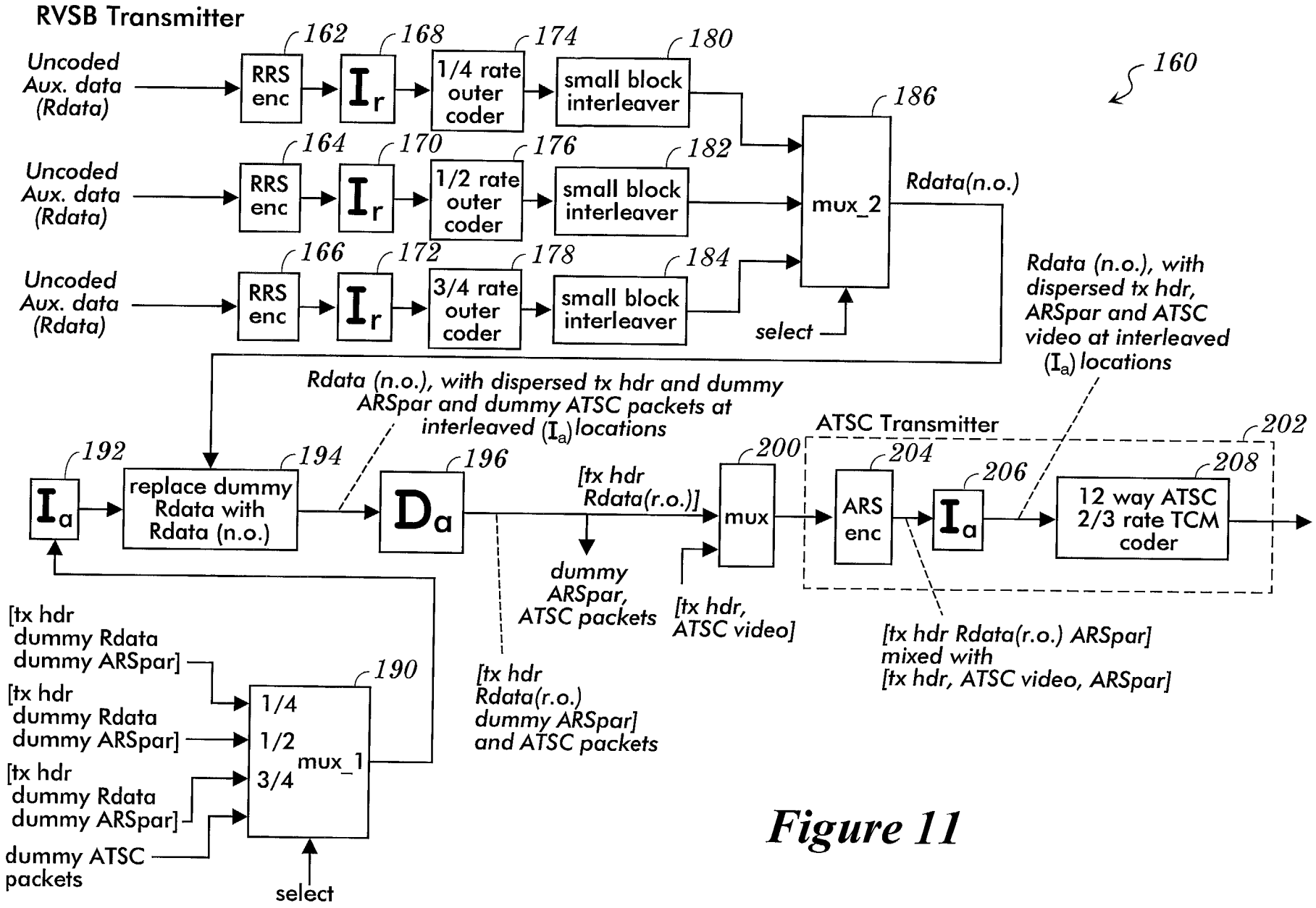
RVSB Transmitter
Uncoded Aux. data (Rdata)
RRS enc
I_r
1/4 rate outer coder
small block interleaver
1/2 rate outer coder
3/4 rate outer coder
mux_2
Rdata(n.o.)
select
160
162
164
166
168
170
172
174
176
178
180
182
184
186
Rdata (n.o.), with dispersed tx hdr, ARSpar and ATSC video at interleaved (I_a) locations
Rdata (n.o.), with dispersed tx hdr and dummy ARSpar and dummy ATSC packets at interleaved (I_a) locations
ATSC Transmitter
I_a
replace dummy Rdata with Rdata (n.o.)
D_a
[tx hdr Rdata(r.o.)]
mux
ARS enc
12 way ATSC 2/3 rate TCM coder
192
194
196
200
202
204
206
208
dummy ARSpar, ATSC packets
[tx hdr, ATSC video]
[tx hdr Rdata(r.o.) ARSpar] mixed with [tx hdr, ATSC video, ARSpar]
[tx hdr dummy Rdata dummy ARSpar]
[tx hdr dummy Rdata dummy ARSpar]
[tx hdr dummy Rdata dummy ARSpar]
dummy ATSC packets
1/4
1/2
3/4
mux_1
select
190
[tx hdr Rdata(r.o.) dummy ARSpar] and ATSC packets

Figure 11

for 1/2 rate outer code

ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 92 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (576 symbols) 72 bytes payload	RRS parity (160 symbols) 20 bytes	ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 92 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (576 symbols) 72 bytes payload	RRS parity (160 symbols) 20 bytes	ARS parity (80 symbols)
2 bits/symbol	1 bit/symbol		2 bits/symbol

Figure 12

for 1/4 rate outer code

ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 46 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 46 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 46 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (416 symbols) 26 bytes payload	RRS parity (320 symbols) 20 bytes	ARS parity (80 symbols)
2 bits/symbol	0.5 bit/symbol		2 bits/symbol

Figure 13

for 3/4 rate outer code

ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 138 bytes payload		ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 26 bytes payload	20 bytes RRS parity | 92 bytes payload	ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 72 bytes payload	20 bytes RRS parity | 46 bytes payload	ARS parity (80 symbols)
ATSC tx hdr (12 symbols)	RVSB data (736 symbols) 118 bytes payload	20 bytes RRS parity	ARS parity (80 symbols)
2 bits/symbol	1.5 bit/symbol		2 bits/symbol

Figure 14

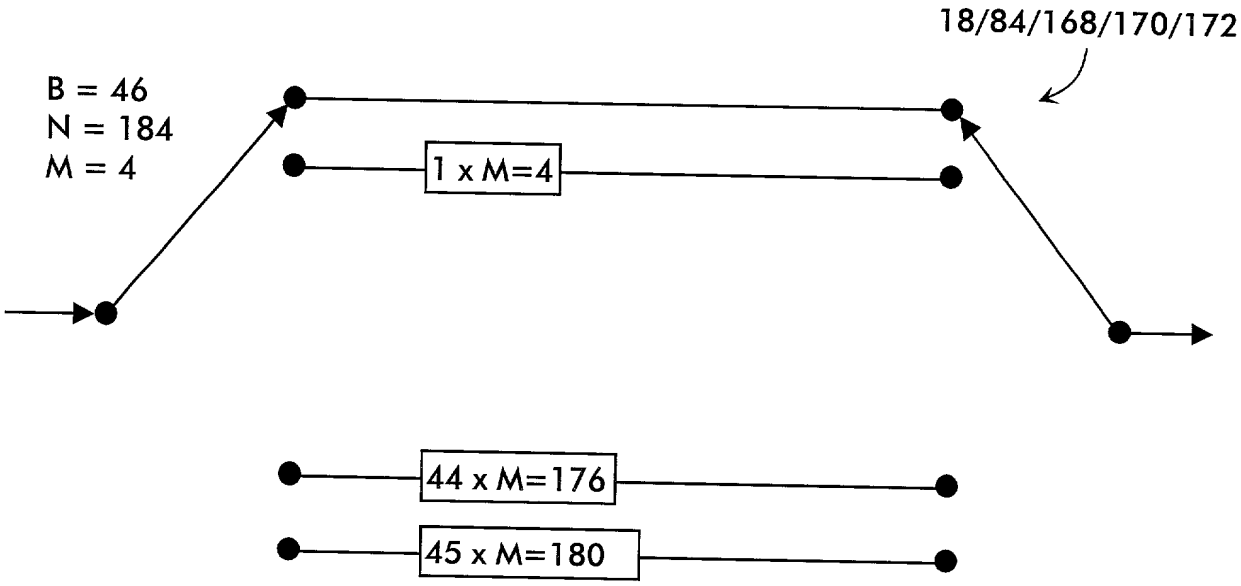

Figure 15

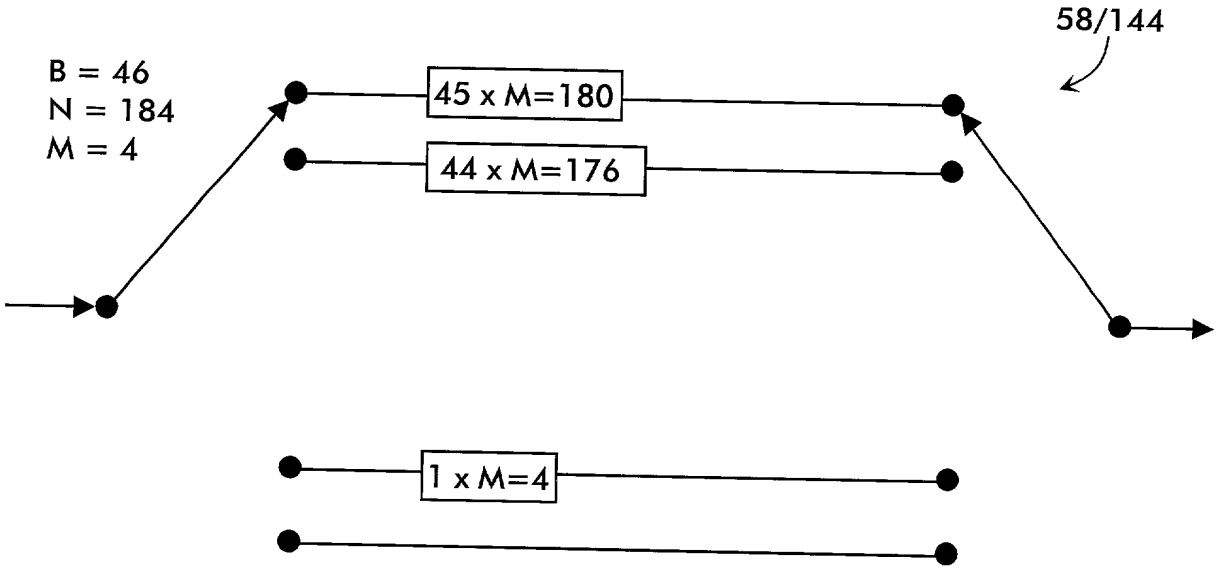

Figure 16

First RVSB RS block of field

RVSB map data (24 bits)	1288 bits

Figure 17

TOETEO" 292+0660

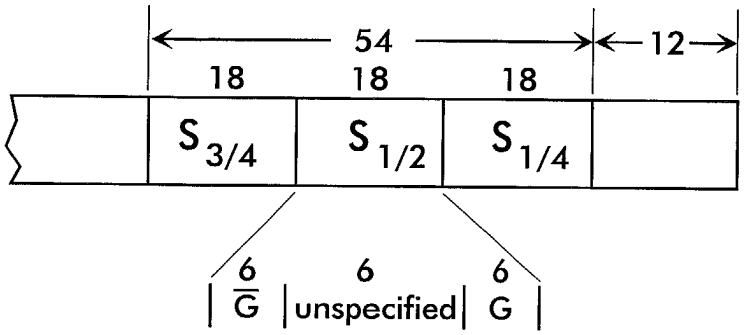

Figure 18

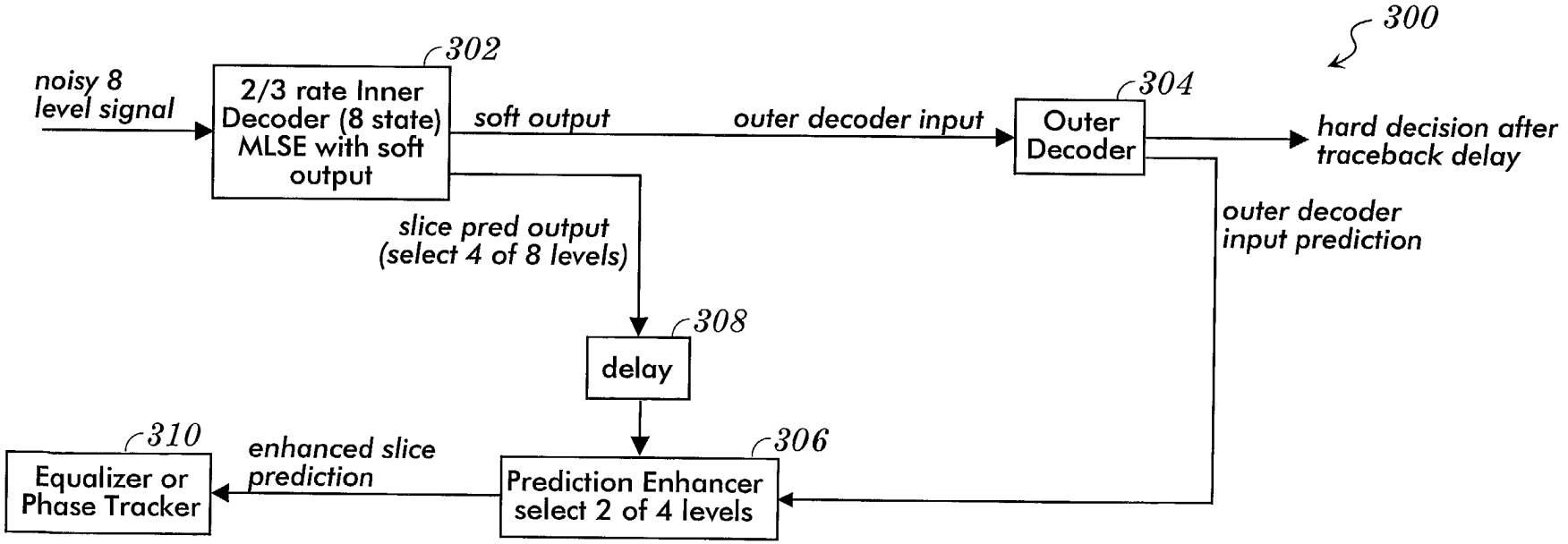

Figure 19

FOETEO" 29&h0660

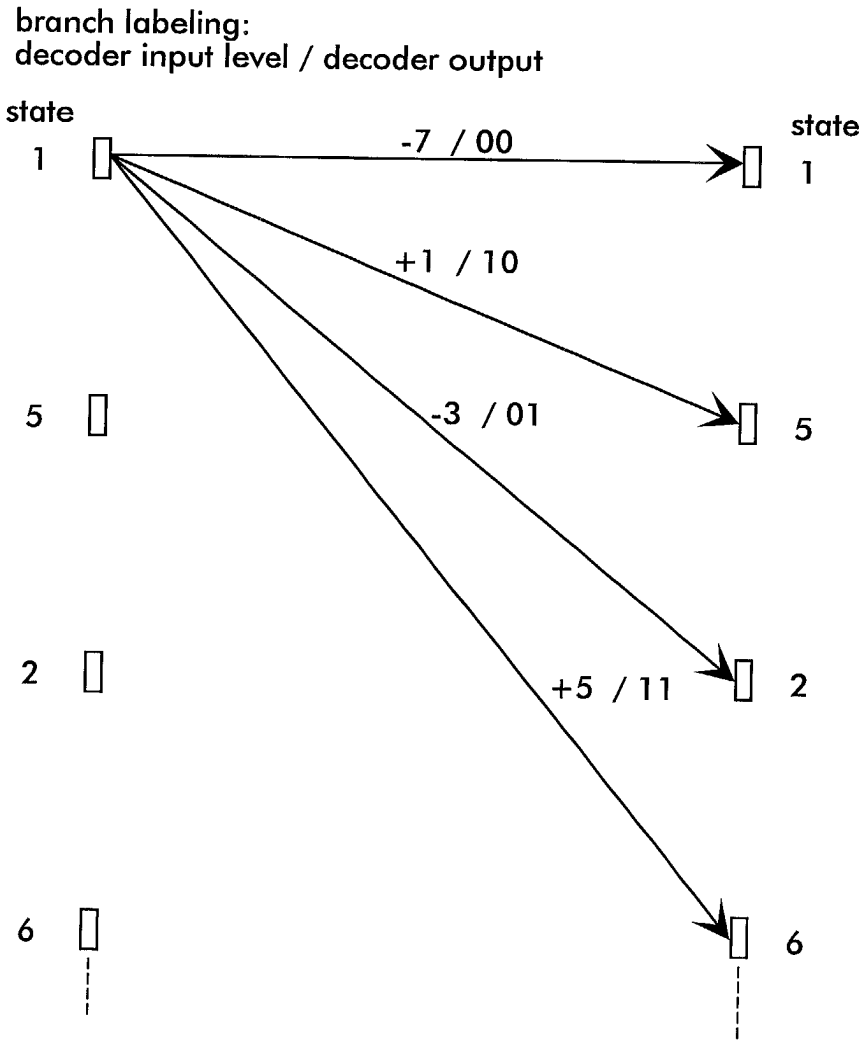

Figure 20

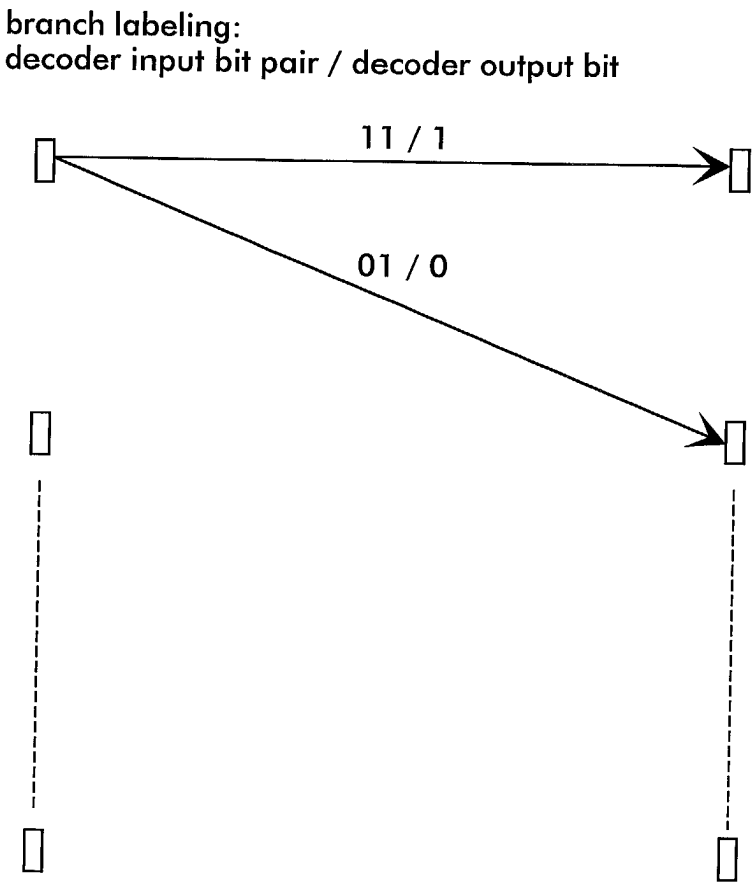

Figure 21

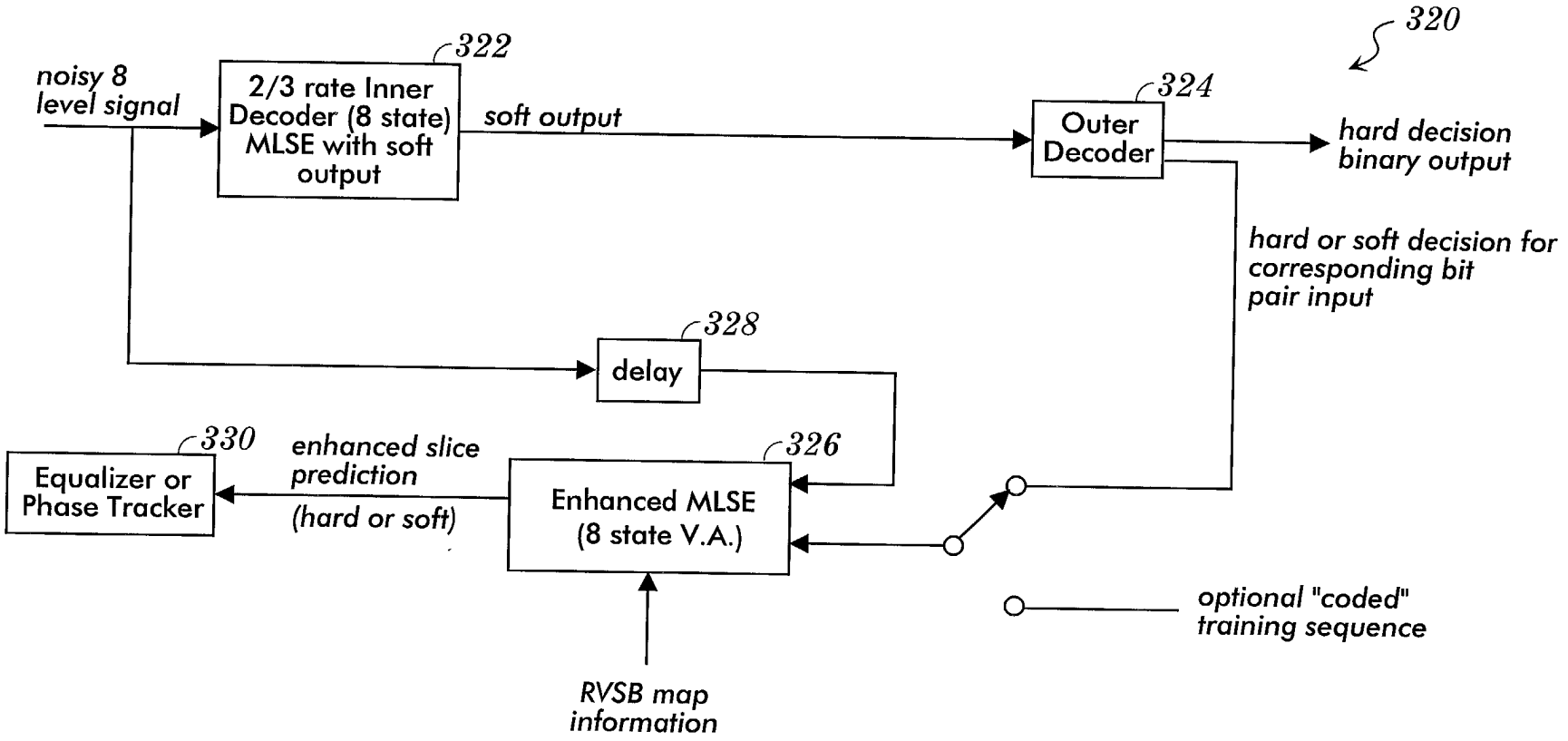
320
322
noisy 8 level signal
2/3 rate Inner Decoder (8 state) MLSE with soft output
soft output
324
Outer Decoder
hard decision binary output
hard or soft decision for corresponding bit pair input
328
delay
330
Equalizer or Phase Tracker
enhanced slice prediction
(hard or soft)
326
Enhanced MLSE (8 state V.A.)
optional "coded" training sequence
RVSB map information

Figure 22